Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-3. (Canceled)

4. (Original) An optical pickup device comprising:

a first light source that emits first light;

a second light source that emits second light having a wavelength different from a wavelength of the first light; and

a step-like diffraction element that deflects one of the first light and the second light to match optical axes of the first light and the second light,

the step-like diffraction element defining a light incident face and a light emitting face, one of the light incident face and the light emitting face having multiple sets of step-like grating faces,

wherein, when a wavelength λ 1 of the first light is longer than a wavelength λ 2 of the second light, a step difference between adjacent ones of the step-like grating faces has a measurement that generates a phase difference corresponding to one wavelength for the first light, and

the number of steps of each of the multiple sets of step-like grating faces is set at an integer that is closest to a value α that satisfies an expression of $\lambda 2/\lambda 1 = \alpha/(\alpha + 1)$.

5. (Original) An optical pickup device according to claim 4, wherein, when the wavelength λ 1 of the first light is about 785nm, and the wavelength λ 2 of the second light is about 650nm, the number of steps of each of the multiple sets of step-like grating faces is five.

6. (Original) An optical pickup device according to claim 4, wherein, when the wavelength λ 1 of the first light is about 635nm, and the wavelength λ 2 of the second light is about 470nm, the number of steps of each of the multiple sets of step-like grating faces is three.

7. (Original) An optical pickup device comprising:

a first light source that emits first light;

a second light source that emits second light having a wavelength different from a wavelength of the first light; and

a step-like diffraction element that deflects one of the first light and the second light to match optical axes of the first light and the second light,

the step-like diffraction element defining a light incident face and a light emitting face, one of the light incident face and the light emitting face having multiple sets of step-like grating faces,

wherein, when a wavelength λ 1 of the first light is longer than a wavelength λ 2 of the second light, a step difference between adjacent ones of the step-like grating faces of each of the multiple sets of step-like grating faces has a measurement that generates a phase difference corresponding to one wavelength for the second light, and

the number of steps of each of the multiple sets of step-like grating faces is set at a value in which one is added to an integer that is closest to a value α that satisfies an expression of $\lambda 2/\lambda 1 = \alpha/(\alpha + 1)$.

8. (Original) An optical pickup device according to claim 7, wherein, when the wavelength λ 1 of the first light is about 785nm, and the wavelength λ 2 of the second light is about 635nm, the number of steps of each of the multiple sets of step-like grating faces is five.

9. (Original) An optical pickup device according to claim 7, wherein, when the wavelength λ 1 of the first light is about 635nm, and the wavelength λ 2 of the second light is about 470nm, the number of steps of each of the multiple sets of step-like grating faces is four.

10. (Original) A method for designing an optical pickup device comprising a first light source that emits first light, a second light source that emits second light having a wavelength different from a wavelength of the first light, and a step-like diffraction element that deflects one of the first light and the second light to match optical axes of the first light and the second light, the step-like diffraction element defining a light incident face and a light emitting face, one of the light incident face and the light emitting face having multiple sets of step-like grating faces, the method comprising the steps of:

when a wavelength λ 1 of the first light is longer than a wavelength λ 2 of the second light, setting a step difference between adjacent ones of the step-like grating faces to have a measurement that generates a phase difference corresponding to one wavelength for the first light; and

setting the number of steps of each of the multiple sets of step-like grating faces to be at an integer that is closest to a value α that satisfies an expression of $\lambda 2/\lambda 1 = \alpha/(\alpha + 1)$.

11. (Original) A method for designing an optical pickup device comprising a first light source that emits first light, a second light source that emits second light having a wavelength different from a wavelength of the first light, and a step-like diffraction element that deflects one of the first light and the second light to match optical axes of the first light and the second light, the step-like diffraction element defining a light incident face and a light emitting face, one of the light incident face and the light emitting face having multiple sets of step-like grating faces, the method comprising the steps of:

when a wavelength λ 1 of the first light is longer than a wavelength λ 2 of the second light, setting a step difference between adjacent ones of the step-like grating faces of each of the multiple sets of step-like grating faces to have a measurement that generates a phase difference corresponding to one wavelength for the second light; and

setting the number of steps of each of the multiple sets of step-like grating faces to be at a value in which one is added to an integer that is closest to a value α that satisfies an expression of $\lambda 2/\lambda 1 = \alpha /(\alpha + 1)$.